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General Methods of Learning in the Works of Medieval Thinkers

Amonova Hikoyat Inoyatovna

Associate Professor of the Department of Medical Chemistry, Bukhara State Medical Institute

Annotation:

The article studies the general teaching methods in the works of medieval thinkers. And also, several groups of general teaching methods were singled out, which were used by almost all scientists - encyclopedists. Particular attention is paid to the methods of activation of cognitive activity and the development of logical thinking in the works of Kindi. Farabi's experimental and visual teaching methods are analyzed. Methodological considerations close in meaning are found in the statements of Beruni. Ibn Sina's "Canon of Medicine" reflects methods widely used by him in teaching medicine, such as a systematic and consistent presentation of knowledge, logically coherent reasoning, leading to an understanding of ancient Greek and Eastern medical science.

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The Eastern Middle Ages, as well as the Western one, was characterized by the indivisibility of the development of scientific problems inherited from the ancient world. In that era, the differentiation of sciences had not yet occurred, and, naturally, scientific knowledge contained a significant element of philosophical reasoning, and the depths of philosophy contained the results of specific research in the field of broadly interpreted physics and the germs of all modern humanities. It is natural that in such a state of scientific knowledge, one can speak of the development of pedagogical, in particular didactic, problems by scientists - encyclopedists, literally understood.

However, as already noted, the scientific treatises of that time also served as teaching aids - and not only for students, madrasahs, but also for everyone who wanted to join scientific knowledge. This circumstance was taken into account, of course, by the authors of scientific works, which was reflected both in their statements regarding the ways of learning, and in the ways of presenting and arguing scientific positions, in the nature of posing educational questions in texts. An analysis of the works of scientists of that time makes it possible to find out, using modern terminology, the principles and income of their authors to teaching methods that correspond to the general laws of knowledge [5-8].

There are several groups of general teaching methods that were used by almost all scientists -

encyclopedists. These are visual-experimental methods, various ways of presenting knowledge, question-answer methods, methods of developing skills and abilities, methods of testing knowledge. At the same time, it is noteworthy that all of them were aimed at activating the cognitive activity of the student, developing his logical thinking.

Thus, the analysis of Khorezmi's arithmetical treatises shows his extensive use of the method of sequential presentation of knowledge in order to develop logical thinking. When I "considered what people need when counting," he wrote, "I found that all this is a number. I found that all numbers are made up of ones, and one is a part of all numbers. I also found that all numbers greater than one and up to ten, we call units. Then the ten is doubled and tripled, just as it is done with a one, and twenty, thirty, and so on up to a full hundred are obtained. Then a hundred is doubled and tripled, similar to how it is done with one and ten, up to a thousand. Then a thousand is repeated in the same way in each combination until the end of the cognizable of the numbers.

The question- answer form was used when commenting on scientific papers. As an example, one can point to the comments on the " Zij " ("Astronomical Tables") of Khorezmi. Their author, the famous Madrid astronomer of the tenth century. Musanna , noted that for a clearer presentation of Khorezmi's thoughts, they used the question-answer method, which makes it easier to understand and memorize the material [9-11].

Kindi paid special attention to methods of enhancing cognitive activity and developing logical thinking. In his opinion, human cognitive activity proceeds from ignorance to knowledge. The mind, according to his teaching, is an active, creative force, an instrument of knowledge of the universe. But knowledge is impossible without prior experience, since the human mind forms concepts of the general through comparison, observation and experience. From this followed the pedagogical conclusion that a person can multiply his knowledge only by enriching sensory perception. Therefore, in teaching , methods based on the experience of the students themselves should be used as widely as possible: "After all, teaching is easy when it concerns familiar things. This is evidenced, in particular, by the liveliness with which students perceive sermons, stories, poems or fairy tales, that is, everything that is told thanks to the habit acquired by them at an early age, to listen to various kinds of narratives and fables. The same thing happens when they consider natural phenomena, because they resort to the preaching method of consideration, and such is necessary only in the study of what is devoid of a mother; for matter experiences action and therefore is in motion, and nature is the primary cause of everything that is moving and at rest.

Farabi also paid great attention to the use of experimental and visual teaching methods . As the primary sources of knowledge about external objects that connect human subjects with an object, Farabi considered five types of sensation: touch, sight, hearing, smell and taste; and "if there is a desire to know a tangible thing through sensation, then by which this desire is achieved will be an act that consists of bodily and mental actions. For example, we want to see an object, we raise our eyelids and direct our gaze to the object we want to see. If the item is removed, we go to it. If an obstacle separates us from it, then we remove this obstacle with our hands. All these actions are bodily actions, but sensation itself is a mental act. And so it is with all the senses. These bodily actions should be used in the learning process. Knowledge of the subject, according to Farabi , can be formed through either thinking power, or imagination, or sensation. The consequence of this is the preservation in consciousness of the forms of "various kinds of intelligible objects of intellect " [12-17].

Farabi paid much attention to visual teaching methods, such as observation and experience, which,

according to him, are the beginnings of knowledge and the foundations of proof. Thanks to the knowledge gained as a result of experience and verified again by experience and observation, the soul of a person becomes rational, and he himself becomes more perfect. "We say," Farabi wrote, "that the child has a cognizing soul in potency. She has feelings, i.e. means of comprehension. Only single things are comprehended by senses, and universals are obtained from single things. Universals are experiments on reality.

These ideas of the outstanding thinker of the East organically follow from the statements of his great predecessor Aristotle that induction is impossible without sensory perception, since separate things are known by sensory perception, because otherwise it is impossible to get knowledge about them. About what is sensually, of necessity, perceived only as an individual, while scientific knowledge is knowledge of the general [18-19].

It is said precisely and far-sightedly: "Reason is nothing but experience." This shows how exceptionally great importance Farabi attached to practice as a source of scientific abstractions and as a criterion of truth. This makes it understandable and appreciated by him a way of learning, which is based on experience.

Applying any teaching method, Farabi believes, first of all, one should think about where to start, what exactly is the subject of study, and what degree of study should be achieved. This approach provides a person with the acquisition of scientific knowledge, which is based on experience and reason, and not on blind adherence to certain dogmas and traditions. The teacher, checking the degree of assimilation of knowledge by the student, should always pay attention to the causes of errors in the answers, lead to the correct conclusions.

Farabi tirelessly emphasized that it is necessary to teach reliable knowledge, which a person cannot refuse, and in which he does not experience doubt, misleading, as well as mistrust and suspicion in any field of knowledge and for any reason. This is achieved by teaching, which is based on the life practice of the student himself.

Farabi considered exercise to be one of the most important general teaching methods. "As a result of long diligent exercises in the art of writing, a person acquires perfection in this art, and the longer he practices this, the stronger and more perfect he becomes in this art, and his skill grows from the constant repetition of these actions, the pleasure arising from this spiritual state, and the person himself with even greater joy and love is engaged in this art. This is how it is with those actions by which happiness is obtained; the more and more often they are carried out and the more perseverance a person shows in them, the stronger, more virtuous and perfect they make the soul, intended for happiness, so that it, more and more perfected, turns out to be not in need of matter and free from it, and this soul is not destroyed together with matter and does not need it for its existence.

Methodological considerations close in meaning are found in the statements of Beruni. He also recommended in teaching to use methods based on the personal experience of students, the question-answer method, experience and observation, in his opinion, are the most reliable means of obtaining new knowledge about nature and human life. "Masters," he wrote, "regarding the composition of the base and the proportions of coloring substances, there are many ways and opinions, but nothing reliable can be learned from them otherwise than by observing the work of experienced craftsmen (personally), participating in this and conducting experiments over compositions" [3].

The repetition and communication of new knowledge in the form of a catechetical conversation was also highly appreciated by Beruni : “knowledge of the structure of the universe and what the figure of the sky, earth, and what is between them, with the help of learning perceived through repetition, is very useful for the art of astronomy , for the student thus acquires the habit and becomes accustomed to the words used by people of this art, so that it is easy for him to imagine these words and understand their meaning. When he returns to them, studying the various causes and proofs of this art, he will approach it with a free mind, not weary of assimilating both.

Therefore, I compiled this memo for the Khorezmian Rayhana , daughter of al-Hasan, at her request, in the form of questions and answers, which is better and easier to understand" [4].

Ibn Sina's "Canon of Medicine" reflects methods widely used by him in teaching medicine, such as a systematic and consistent presentation of knowledge, logically coherent reasoning, leading to an understanding of ancient Greek and Eastern medical science. It was thanks to the brilliantly thought-out methodological construction that the Canon of Medicine became the most widespread textbook of medicine and was used for five centuries not only in the East, but also in Europe. This monumental work was published about 40 times in full and countless times in excerpts.

The Canon consists of five books. The first book is devoted to the theory of medicine. It defines this science, provides information about the human body and a general overview of methods of treatment, and indicates preventive measures to prevent diseases. The second book deals with simple remedies and their application. More than 780 medicinal substances are described here. The third book contains information about the diseases of individual organs of the human body and how to treat them. At the beginning of each section there is a corresponding anatomical and physiological introduction. Diseases of the head, mental illnesses, diseases of the eyes, nose, ears, mouth, throat, lungs, etc. are considered. The fourth book deals with the general diseases of the human body and indicates the methods of their treatment. The fifth book is devoted to healing agents that are not found in nature in finished form, but are made by doctors. It is interesting to note that in the "Canon" Ibn Sina devotes a significant place to the issues of physical education of children [20-25].

About the construction of this work and the method of presenting the content, Ibn Sina himself wrote as follows: “And I decided to talk first about general, all-encompassing issues in both parts of medicine, that is, in the theoretical part and in the practical part ; then, after that, talk about the general laws of action of simple drugs, and then - about the particular (manifestations) of these laws. Then, after that, I talk about diseases that occur in each organ separately, and first I begin with the anatomy of this organ and its usefulness. As for the anatomy of individual simple organs, it is mentioned in the first, general book, as well as their benefits.

Having finished with the anatomy of a given organ, I in most cases begin with instructions on how to keep it healthy , then point out, speaking without regard, to the general diseases of this organ and their causes, and touch, also speaking in general, on the ways of recognizing and treating such diseases. After these general data, I turn to particular diseases and in most cases also indicate first the general rule for determining the distinguishing signs, causes and manifestations of the disease, and then move on to particular rules. After that, I give the general law of its treatment, then I set out the particular methods of therapy with various drugs, simple and complex. Simple medicines and their usefulness in the treatment of diseases have also been mentioned before, in the book of simple medicines, in the sections and rubrics that I think it expedient to use in this book, as you yourself, O student, will see when you get to it. Here I repeat only a little of it.

Ibn Sina, teaching methods should be based on the logical thinking of students, their personal observations and experience. When forming concepts as a tool for finding truth, he considered it necessary to proceed from knowledge about the real world, and not from speculative scholastic reasoning. Observations, experience, experiment, practice as methods of knowledge and learning, according to Ibn Sina, reveal the laws of nature and thereby contribute to the power of man on earth.

“When they say that in medicine there is something theoretical and something practical,” he wrote, “one should not think, as many researchers of this issue imagine, that they mean by this that one part of medicine is knowledge, and the other part is action. On the contrary, you should know that it means something else. Namely, each of the two parts of medicine is nothing but a science, but one of them is the science of the basics of medicine, and the other is the science of how to apply it. The first of these parts is given the name of science and theory, and the second - the name of practice. By the theory of medicine, we mean that part that teaches only the basic rules and is not included in the presentation of the essence of any procedures ... And by the practice in medicine, we mean not only the physical action and the space of any body movements, but also that part of medical science, training which consists of useful advice and this advice is connected with the presentation of the essence of any procedure ... When you study both of these parts, you will acquire scientific knowledge and practical knowledge” [1, p.94].

This explanation of Ibn Sina is striking in its clarity and didactic clarity. This reflects the closest connection between theory and practice, following from the general to the particular, and relying on experience. The logic of building a multi-volume "Canon of Medicine", the availability of presentation, versatile argumentation. A clear explanation of the practical rules for diagnosing and treating diseases, the desire to constantly reveal causal relationships - all this can now serve as a good example for the authors of textbooks.

But perhaps the main thing that any teaching methodology should provide is the disclosure to students of the causes of the occurrence of the things and phenomena being studied. “These reasons are obvious, but there are also hidden ones, comprehended not by feeling, but by inference on the basis of accidents; therefore, in medicine, it is also necessary to know the accidents that take place in health and in illness. In the true sciences, it is explained that the knowledge of a thing is acquired through the knowledge of its causes and principles, if they are inherent in it, and if they are not, then through the knowledge of its accidents and essential features” [1, p.98].

Summarizing the main considerations of encyclopedic scientists about teaching methods, we can draw a fairly reasonable conclusion that these methods were based on a certain system of principles that was discussed above.

Whatever methods used in teaching various sciences, arts and crafts are discussed - oral types of presentation and explanation of knowledge, conversations of various types, experiments, etc. - they should equip students with true knowledge, develop independent logical thinking, teach practical application of acquired knowledge [26-28].

Thus, in the works of Eastern scientists, many didactic ideas were already outlined and received a certain disclosure, which became the subject of special development in the pedagogy of modern times, especially thanks to the efforts of the great Czech teacher J. A. Comenius.

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